# New Literature

## Life Cycle Assessment (LCA) – Quo Vadis?

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Life Cycle Assessment (LCA) is a way to evaluate and compare the environmental impacts of products that is growing in popularity. Goals for performing an LCA include comparing the environmental impacts of several products and identifying areas for improvement in the production process, among others. The underlying assumption in defining these goals is that LCA can provide an answer that is somewhat accurate and certain. The alternative to LCA is a site-specific environmental management approach which is focused on managing a firms activities in a manner that minimizes environmental impacts while maximizing stakeholder benefits. Both of these approaches are presented and discussed in "Life Cycle Assessment – Quo Vadis?" (Which path should be taken for the future development of LCA?) written by a multi-disciplinary group of European researchers and LCA-practitioners.

The **first part** of the book outlines these two possibilities which are reflected in the current activities of the International Standards Organization (ISO) and recently passed regulations of the European Union. For example, one set of ISO standards deals with the impacts of products (i.e., ISO 14020 ff.) whereas another set of standards is oriented towards the environmental management systems of production sites (i.e., ISO 14001).

The **second part** of "Life Cycle Assessment (LCA) – Quo Vadis?" identifies, evaluates, and discusses the components, different approaches, software tools, and uncertainties associated with performing a LCA. Overarching LCA topics that are discussed include:

- How and where should the system boundaries of a product life cycle be drawn? The issues associated with defining adequate system boundaries are identified. Approaches for setting system boundaries are also proposed and discussed.
- How can environmental interventions be allocated to products? As in cost accounting, environmental impacts and interventions must be allocated to the products which caused the impacts. This can be done by applying some of the principles of cost-allocation as well as new science oriented LCA approaches.
- How are background inventory data collected and used? Research institutions, public and governmental organizations are establishing publicly available databases for LCA. These databases contain information regarding the environmental impacts of pre-steps, which are commonly used input materials and raw materials, such as aluminium or packaging, and post-steps which are down stream processes such as sewage treatment. These so-called background inventory data databases are being developed in order to facilitate the assessment of environmental impacts outside a firm's boundaries.
- How can imprecision and uncertainty in LCA be analyzed? LCA's rely on data such das quantities of chemicals released to the environment as well as schemes to evaluate the resulting environmental impacts. The imprecision and uncertainty of data in an LCA inventory is commonly so large that meaningful comparisons between different products or time periods are difficult or impossible to make in most cases. This is a fundamental issue for LCA because it calls into question the whole approach and the basis for making these kinds of comparisons. In addition, these findings indicate that the focus of LCA efforts should be shifted from impact assessment to data collection.
- How can relevant environmental interventions be distinguished from irrelevant information? High costs of data collection could be reduced by focusing on the relevant information and omitting the irrelevant. Several approaches for determining what is relevant in advance of performing the study are presented.
- What features must LCA software have? Because of the quantity of data typically used to conduct an LCA a sophisticated software tool is necessary. The features and capabilities of one tool, EMIS LCA software are discussed. Combining EMIS with site-specific environmental data enables the user to consider data quality uncertainty as well as use a variety of impact assessment approaches.

The **third section** of the book provides a case study of an LCA of beer which utilizes the approaches identified earlier in the book. The assumptions and calculations are clearly documented. This provides an excellent example for those who are interested in the nuts and bolts of LCA.

The **last section** of the book asks and answers the question of whether there is any value in LCAs as they are currently performed and the answer is surprising! Based on a critique of the current approach of LCA the alternative concept of site-specific LCA is proposed as a better approach based on economics and inventives. The accuracy, representativeness, completeness, and reliability of information can be substantially improved using a site-specific LCA approach because the data are validated by an external auditor and the problems associated with using aggregated data can be avoided. Specifically, the site-specific approach will result in data that are much higher quality than the background inventory data that are currently used to conduct LCAs.

LCA practitioners, environmental managers and business leaders will find this book especially interesting because it clearly identifies the approaches, methodologies, and issues associated with performing LCAs and using LCA as a tool to evaluate environmental performance. The book also provides an excellent big picture evaluation of the value of the LCA versus site-specific environmental management tools.

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# New Book Information

## Environmental Assessment of Industrial Products

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This major two-volume work presents a new decison making tool which enables manufacturers and scientists to undertake Life Cycle Assessment (LCA) of new products from the design and development stages. The methodology allows the environmental consequences of a product to be assessed in the same way as traditional commercial parameters such as price, strength, etc. Significantly, it is in accordance with international consensus, as defined by SETAC (Society of Environmental Toxicology and Chemistry) and ISO (International Organizaton for Standardization). Moreover, the methodology has made the individual steps operational by creating a method data basis for the assessment.